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Short report

Work stress of primary care physicians in the US, UK and German health care systems☆

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ABSTRACT

Work-related stress among physicians has been an issue of growing concern in recent years. How and why this may vary between different health care systems remains poorly understood. Using an established theoretical model (effort–reward imbalance), this study analyses levels of work stress among primary care physicians (PCPs) in three different health care systems, the United States, the United Kingdom and Germany. Whether professional autonomy and specific features of the work environment are associated with work stress and account for possible country differences are examined.

Data are derived from self-administered questionnaires obtained from 640 randomly sampled physicians recruited for an international comparative study of medical decision making conducted from 2005 to 2007. Results demonstrate country-specific differences in work stress with the highest level in Germany, intermediate level in the US and lowest level among UK physicians. A negative correlation between professional autonomy and work stress is observed in all three countries, but neither this association nor features of the work environment account for the observed country differences.

Whether there will be adequate numbers of PCPs, or even a field of primary care in the future, is of increasing concern in several countries. To the extent that work-related stress contributes to this, identification of its organizational correlates in different health care systems may offer opportunities for remedial interventions.

Background

Work-related stress among physicians has been an issue of growing concern in recent years (Bond & Bond, 2000). It appears most evident among primary care physicians, who care for the majority of illness in society. Recent organizational and legal changes are thought to impact physician autonomy (clinical guidelines and performance measures), while heavier workloads, and changing reimbursement methods (pay-for-performance and salaried positions) appear to contribute to the growing levels of job pressure reported by primary care providers (Calnan, Wainwright, Forsythe, Wall, & Almond, 2001; Firth-Conzens & Payne, 1999; Linzer et al., 2002; Routh, Cooper, & Routh, 1996; Sundquist & Johansson, 2000; Uncu, Bayram, & Bilgel, 2007). Heavy workload is also widespread among more specialised physicians, including those working in hospitals, but is less often combined with threats to income security and job continuation (Collier, McCue, Markus, & Smith, 2002; Li, Yang, & Cho, 2006; Richter, Stoll, & Plaff, 2007; Spickard, Gabbe, & Christensen, 2002).

Despite this evidence, scientific knowledge on the determinants and consequences of physicians' work stress remains limited for several reasons. First, with some notable exceptions (Calnan, Wainwright, & Almond, 2000; Li et al., 2006; Richter et al., 2007; Sundquist & Johansson, 2000), most studies are not based on a theoretical model that delineates stressful experience at a level of generalisation that allows for its identification in a wide range of complex and different work settings. Several such theoretical models have been developed, in particular the person–environment-fit model (French, Caplan, & Harrison, 1982), the demand–control model (Karasek & Theorell, 1990), and the effort–reward imbalance model (Siegrist, 1996). The latter two

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models are most often tested in epidemiological studies. The demand–control model (Karasek & Theorell, 1990) defines stressful work as the combination of two major task characteristics, high demands and low control or decision latitude. An additional assumption claims that social support at work moderates their adverse effects on health. According to the effort–reward imbalance model (Siegrist, 1996) stressful experience at work is elicited by continued non-reciprocal exchange in terms of high cost (high level of effort spent) and low gain (low reward received in turn). Rewards are defined by three transmitter systems: money, esteem/recognition, and career opportunities including job security. The two models complement each other, the former deals with job characteristics while the latter deals with work contract-related aspects. They both are measured with standardised, psychometrically validated questionnaires that provide reliable data, permitting comparisons across study populations (Karasek et al., 1998; Siegrist et al., 2004).

Second, there is a dearth of evidence from longitudinal observational investigations that predict prospective changes in physicians' performance, well-being and health on the basis of their initial exposure to work stress. Third, while a high level of work stress among primary care physicians is generally recognised, research so far largely failed to analyse the potential impact of different service systems within and between countries on physicians' well-being and performance (Linzer et al., 2002).

This study attempts to fill two of these gaps, first, by assessing physicians' level of work stress by a theory-based measurement approach, and second, by comparing work stress among physicians in three different national health care systems, the United States (US), the United Kingdom (UK), and Germany. For the following reasons, the assessment of a stressful psychosocial work environment was based on the effort–reward imbalance model. First, the condition defined by this model was found to be frequent in person-based service occupations and professions (such as physicians and nurses) (Bakker, Killmer, Siegrist, & Schaufeli, 2000; Calnan et al., 2001). Second, at least three studies of work stress among physicians applied this model and documented consistent associations with reduced health and well-being (Calnan et al., 2000; Li et al., 2006; Richter et al., 2007). Third, cumulative evidence on adverse effects of effort–reward imbalance on physical and mental health is available from prospective epidemiological investigations conducted in working populations from several countries, including two of the countries represented in this study (Siegrist & Wahrendorf, 2009; Tsutsumi & Kawakami, 2004).

To examine organizational variations in the level of work stress among physicians, as measured by this model, we compared primary care physicians in three different systems of health care provision: 1) a largely private insurance-based system (US), 2) a government-supported, tax based system (UK), and 3) a mixed system with corporatist and federalist features, administered by social security agencies (Germany). Additionally, we assessed the degree of physicians' perceived professional autonomy as this latter variable is thought to be of crucial importance in mediating upstream features of health care provision with everyday work experience (Coburn & Willis, 2000; McKinlay & Marceau, 2002).

Methods

Study design

In-depth interviews and self-administered questionnaires, including the questions on work stress which are of special interest for this analysis, were administered during two balanced factorial experiments designed to simultaneously measure the unconfounded effects of (a) patient attributes (age, gender, race/ethnicity, and socio-economic status), (b) physician characteristics (gender and years of clinical experience), and (c) health care system (United States (US), the United Kingdom (UK), and Germany) on medical decision making with respect to common medical problems: type 2 diabetes and coronary heart disease (CHD) (McKinlay et al., 2006). These studies were conducted concurrently from September of 2005 to July of 2007. These experiments included equal numbers of physicians in groups classified by gender and experience, and of their decisions on filmed patients categorised by gender, age, race/ethnicity, and socio-economic status. The diabetes experiment consisted of two vignettes (undiagnosed diabetes and diagnosed diabetes with an emerging complication) and was run in three countries (US, UK, and Germany). The coronary heart disease study was conducted in the US, but utilised the same experimental design as the diabetes study. Thus, our interview and questionnaire data are from two studies (Diabetes and CHD) with similar study designs. The data are drawn from primary care physicians practicing in three different health care systems (Diabetes – US, UK, and Germany; CHD – US only). The study protocols for both studies were approved by the ethical committees of the respective study sites, and all participants gave signed informed consent.

Study populations

To be eligible for selection for both studies, physicians had to (a) have completed a medical residency program in either internal medicine or family practice (US), or general practice (UK, Germany), (b) provide primary care at least 50 percent of their time, and (c) work within the designated geographical area. For the Diabetes study, the physicians were required to have a medical degree from a recognised academic institution in the country of sampling. However, this inclusion criteria did not apply to the CHD study conducted in the US, where international medical graduates were included. As a factorial experiment, equal numbers of male and female participants with either greater (>15 years) or less (<5 years) clinical experience were randomly sampled from membership databases in each country.

In the US, physician participants were selected from a listing of physicians practicing in New Jersey, New York, and Pennsylvania (Diabetes study; $n = 192$) (study 1) and in North and South Carolina (CHD study, $n = 256$) (study 2).

In the UK, the sample of general practitioners was drawn from the National Primary Care Research and Development Centre database which is accessed for authorised research. Participants were recruited from urban and rural areas practicing within 150 miles of Manchester city ($n = 128$). The UK participants were required to respond to a letter before being contacted by an interviewer. Therefore, there were more opportunities for passive refusal than in the other two countries, and reasons for any non-response could not be ascertained. Yet, in terms of demographic characteristics (see Table 1) the UK doctors did not differ from the US or German doctors, except that they were slightly younger.

In Germany, the sample ($n = 64$) was drawn from a list of 5732 family doctors and GP-internists available for sampling, provided by the North Rhine Physicians Board. This region represents more than 10 percent of the German population.

The German and British samples were smaller in the Diabetes study because not all race/ethnic categories of patients could be included in the factorial design (Black, White, and Hispanic) in these countries.

Apart from these few exceptions, the sampling and data collection procedures were similar in each country, as consistent eligibility criteria and specific regional criteria were observed. Data collection occurred in the doctor's office during a usual practice day